INSTRUCTION MANUAL

NO. 5877

BARBER COLMAN

Amplitrol®

FOR:
HEAT TREATING
TEMCO FURNACE

model 151P and 152P

" 152P-418-0-6

Serial No 26J1421

BARBER-COLMAN COMPANY, ROCKFORD, ILLINOIS
WHEELCO INDUSTRIAL INSTRUMENTS DIVISION

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INSTRUCTION MANUAL — MODELS 151P and 152P NON-INDICATING CONTROLLERS

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NOTE: This instruction manual to be given to persons responsible for installation and maintenance of this instrument.

UNPACKING INSTRUMENT

This Wheelco instrument and its associated equipment have been carefully manufactured and packed at the factory. Remove the instrument and accessories from the packing box and check items against the packing slip. If the equipment is found to be damaged in transit, report extent of damage to the carrier immediately. Repack in original packing box until ready for installation.

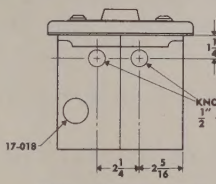
CAUTION:

Handle with care.
Safeguard instrument from shock.
Avoid oil accumulation.
Keep instrument temperature under 130°F.

MOUNTING INSTRUCTIONS

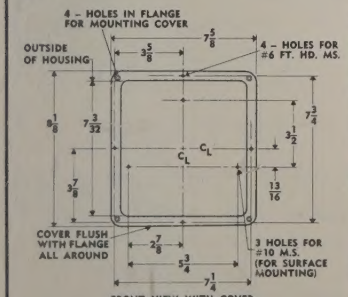
Locate the instrument to avoid shock, dirt, moisture and temperatures over 125°F. Provide suitable shelter to avoid moisture and temperature extremes if installed outdoors. For panel or flush mounting, provide an opening 6⅞" wide by 7⅜" high.

For wall or surface mounting, remove chassis and secure housing to surface. See mounting dimensions.

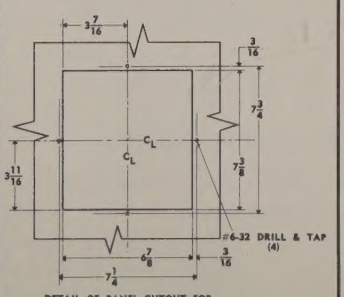


CONDUIT KNOCK-OUT LOCATION

MOUNTING DIMENSIONS


4 – HOLES IN FLANGE FOR MOUNTING COVER
OUTSIDE OF HOUSING
4 – HOLES FOR #6 FT. HD. MS.
COVER FLUSH WITH FLANGE ALL AROUND
3 HOLES FOR #10 M.S. (FOR SURFACE MOUNTING)

FRONT VIEW WITH COVER AND CHASSIS REMOVED



DETAIL OF PANEL CUTOUT FOR FLUSH MOUNTING

WIRING

Run all wires in pipe, conduit or Greenfield (BX) in accordance with local electrical code. Run thermocouple extension lead wire in separate conduit. Several thermocouple wires may be run in the same conduit.

Line connections are for 120 or 240 volt, 60 cycle operation only.

Use only extension lead wire correct for the type of thermocouple (TC) as specified on the scale. The most commonly used types are: Iron-Constantan (I/C), Chromel-Alumel (C/A), and Pl 87%-Rh 13%/ Pl 100%. Ordinary Copper wire will NOT serve the purpose.

Proper polarity (+) and (—) of the lead wire must be observed to obtain correct readings. The negative wire is usually coded red. Correct polarity of lead wire can be checked by connecting the lead wire to the thermocouple terminals and twisting the free ends together. Set the control dial to about 200°F. and with the instrument powered, the control indicator lights should switch from "ON" to "OFF" when lead wire junction is heated.

Connect the lead wire to the thermocouple, and when heated, the control indicator lights should also switch from "ON" to "OFF". If not, reverse the connections at the thermocouple head, since the lead wire was correctly connected at the instrument.

See sheet on External Wiring Diagrams for additional information.

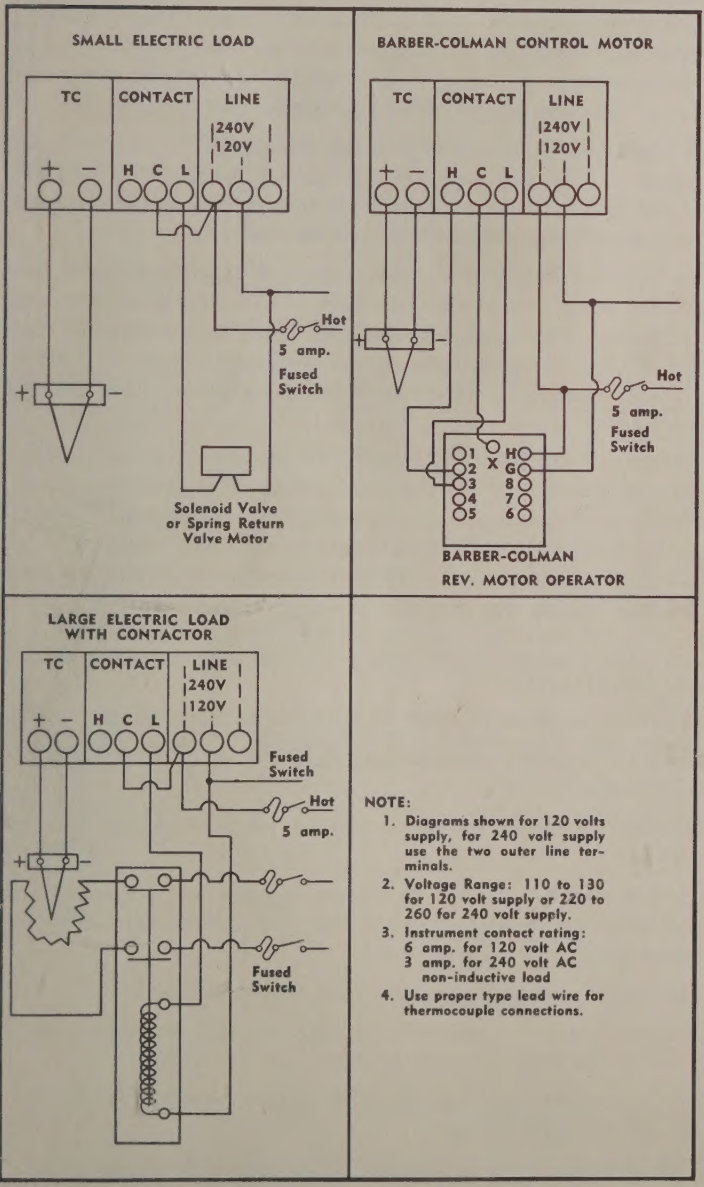
DESCRIPTION OF ELECTRONIC CIRCUIT

The output of the thermocouple is applied across a known resistance in the bridge circuit. Any difference in the potential of the two millivoltages is amplified by means of a saturable core reactor to control the firing of a thyratron and actuate the instrument relay. An open or break in the thermocouple circuit causes the instrument to remain in the "OFF" position regardless of temperature setting.

CONTROL CIRCUIT

The control circuit in the instrument consists of a SPDT switch brought to terminals marked H-C-L which indicate high, common and low. Contacts C to L made when temperature is below control point which break to make C to H when temperature is above control point. Contact rating is 6 amperes at 120 volts or 3 amperes at 240 volts, non-inductive load.

EXTERNAL WIRING DIAGRAMS
WHEELCO MODELS 151P AND 152P



NOTE:

1. Diagrams shown for 120 volts supply, for 240 volt supply use the two outer line terminals.
2. Voltage Range: 110 to 130 for 120 volt supply or 220 to 260 for 240 volt supply.
3. Instrument contact rating:
   6 amp. for 120 volt AC
   3 amp. for 240 volt AC
   non-inductive load
4. Use proper type lead wire for thermocouple connections.

OPERATION

Adjust or position the temperature scale or dial so that the desired control point is in line with the fixed red pointer. When the instrument is powered and the temperature at the thermocouple is below the control setting, contact C to L will be made to turn on the heat and is indicated by the "ON" pilot lamp.

When the temperature at the thermocouple reaches the control setting, contact C to L will break and C to H will make and is indicated by the "OFF" pilot lamp. Thus, the instrument will operate to control the temperature "ON" and "OFF" at the control point.

To find the temperature at the thermocouple at any given time, turn the dial slowly until you find the point at which the pilot lamps turn "OFF" and "ON" and read the temperature at the control index. *CAUTION:* Unless the dial is moved very slowly, the control differential will appear to be extremely wide and temperature indicated will be in error.

Operation of the Model 151P and 152P is essentially the same except that the Model 152P has the added feature of a time proportioning device to reduce temperature variation. This is accomplished by alternately heating one of two coils added to the circuit. This causes an automatic cycling of the control approximately every 15 seconds which produces "anticipatory" action.

MAINTENANCE

Do not oil or grease any part of the instrument at any time.

Inspect all terminal connections regularly, both thermocouple and control circuits.

Check thermocouple for deteriorated hot junctions. Replace if questionable.

Be sure the lead wire and the thermocouple polarity are correct and the wires are not damp or grounded. Only the hot junction of the thermocouple may be grounded.

Replace the electronic tube if control fails to operate.

Do not handle the instrument or apply force to the scale plate or shaft as the slide wire potentiometer may be damaged.

If the instrument stays in the "OFF" position, check for a break in the thermocouple circuit.

The corresponding pilot light will indicate when the control is "ON"

MAINTENANCE (Cont.)

or "OFF". However, the pilot bulb apparently not burning will have a slight glow if observed closely.

Be sure the corresponding line voltage is connected to the correct terminals.

It is recommended that the instrument housing be grounded.

Use burnishing tool or equivalent if necessary to clean contacts of instrument relay.

The following spare parts are recommended:

Replacement Tube (2D21)	Part No. 31-018
Pilot Lamp (#51)	Part No. 36-022
Replacement Thermocouple	

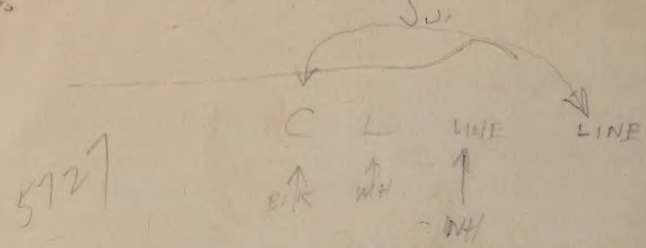
MATERIAL WARRANTY: All equipment except tubes, photocells, and thermocouples, which within one year from date of shipment is found to have been originally defective, will be repaired (replaced if necessary) free of charge, if returned immediately, prepaid to the factory at Rockford, Illinois. The seller shall not be liable to the purchaser, or to any other person, firm or corporation for any direct, indirect or consequential damages or injury of any kind or character; that by acceptance of such equipment the purchaser shall accept and assume all liability for any and all damages or injuries that may result from the use or misuse of such equipment by the purchaser, or by any other person, firm or corporation; and that there shall be no other warranty whatever, expressed or implied, with respect to such equipment.

Warranty and Inspection Card — **PLEASE FILL OUT AND RETURN**

This equipment is guaranteed in accordance with the statement of warranty appearing on our quotation and acknowledgement forms. Upon receipt of this card properly filled out Warranty becomes effective. All Barber-Colman instruments are manufactured to the highest standards of quality and are carefully inspected before packing. Instruments which have been damaged or fail to operate upon installation, should be reported to the Factory at once.

BARBER-COLMAN COMPANY
Wheelco Industrial Instruments Division

MODEL NO.	Date Received
	Company
SERIAL NO.	Street
	City Zone State
CALIBRATION INSP.	By Title
	COMMENTS
FINAL INSPECTION	



MP MASTER
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